Physical Creation Story

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5-1-2019

Summary

The fundamental consideration of physical reality quickly leads to a story of creation, in which the whole course of creation of what occurs in the universe is told.

1 Motivation

More and more my theories about the structure and the behavior of the universe became looking like a story of the creation of the universe [1]. This is an alarming development because of scientists and especially physicists averse to religious concepts inside scientific documents. Still, I decided to write my theory in the form of a creation story. It is mixed with many mathematical and physical concepts because I wanted to generate a paper that is scientifically justified. I cannot avoid treating what can be accomplished with Hilbert spaces and number systems [2]. They play an essential role in the theory as ways to store the dynamic geometric data that describe the life story of tiny objects. The same holds for shock fronts. These are field excitations that appear to constitute all other objects.

Already at the instant of creation, the creator appears to have archived all dynamic geometric data of all discrete objects in a read-only repository. In this repository, every elementary particle owns a private book that contains its full life story. Elementary particles behave as elementary modules, and together they constitute all other modules. Some modules constitute modular systems. My readers are intelligent modular systems. Freethinkers will be disillusioned by the fact that everything is already determined in the repository. The creator fools them by applying stochastic processes in the generation of the footprints of the elementary particles.

By installing a few ground rules, the creator generated a very complicated universe that contains intelligent creatures. This creation process took more than thirteen billion years, but the result exists in front of our nose.

By showing that he is a modular designer and a modular constructor, the creator presents his intelligent creatures an interesting example.

2 Introduction

This story is not about religion. It concerns the creation of the universe. If a creator is mentioned, then this concerns a creating abstract object and not an individual that creates.

The universe is a field in which we live. The field can be deformed by the embedding of massive objects and is a carrier of radiation, of which a part can be observed with the naked eye.

The physical reality is represented by this field and what happens in this field.

What appears in this field is at the time of creation stored in an abstract storage medium. This storage medium is here called the Hilbert Book Model. The HBM consists of a large number of separate books that each describe the history of an elementary particle and a background platform that archives the history of the universe in another way. Each part of the model describes the genesis, the past, the present and the future of the described subject. The present is a window that runs across all the books.

3 Creation

This historiography gives the opportunity to speak about a story of creation. In fact, the model itself is the creator of the situation.

Elementary particles are described in a mathematical storage medium known as a quaternionic separable Hilbert space. A Hilbert space is a special vector space that provides an inner product for each pair of vectors. Quaternions are arithmetic numbers composed of a scalar and a three-dimensional vector. Therefore, they are ideally suited as a storage bin for a time stamp and a three-dimensional location. The quaternions give the number value to the inner product of the corresponding vector pair. The separable Hilbert space contains operators that describe the map of the Hilbert space onto itself and can store rational quaternions into storage bins that are attached to Hilbert vectors. The numbers are called eigenvalues, and the corresponding vectors are called eigenvectors. Together, the eigenvalues form the eigenspace of the operator.

Quaternionic number systems exist in many versions that differ in the way that Cartesian and polar coordinate systems rank their members. Each quaternionic separable Hilbert space chooses its own version of the number system and maintains that choice in the eigenspace of a special reference operator. In this way, the Hilbert space owns a private parameter space. The private separable Hilbert spaces of elementary particles hover with the geometric center of their parameter space over the parameter space of the background platform. By using this parameter space and a set of continuous quaternionic functions, a series of newly defined operators can be specified. The new defined operator reuses the eigenvectors of the reference operator and replaces the corresponding eigenvalue by the target value of the selected function by using the original eigenvalue as the parameter value. This newly defined operator contains in its eigenspace a field that is defined by the function. The field is a continuum. The eigenspaces of the operators are countable. Thus, the eigenspace of the new operator contains the sampled values of the field. In fact, the private parameter space is also a sampled continuum. The eigenspace of the reference operator contains only the rational elements of the selected version of the number system.

Nothing prevents all applied separable Hilbert spaces from sharing the same underlying vector space. We assume that the background platform is a quaternionic separable Hilbert space which contains infinitely many dimensions. This possesses a unique non-separable partner Hilbert space that supports operators, which possess continuous eigenspaces. These eigenspaces are therefore complete fields. Such eigenspaces are not countable. One of these operators owns an eigenspace that contains the field, which represents the universe. This field is deformed by the embedding of the hop landings of the elementary particles. The locations of the hop landings are stored in the eigenspace of the footprint operator in the private Hilbert space of the corresponding elementary particle. After sorting the timestamps, the footprint operator's eigenspace describes the entire lifecycle of the elementary particle as one continued hopping path. That hopping path recurrently generates a swarm of hop landing locations. A location density distribution describes the swarm. Because the particle is point-shaped, this is a detection probability density distribution. This is equal to the square of the modulus of the what physicists call the wavefunction of the elementary particle. The hop landing location swarm represents the particle.

4 Dynamics

At the time of the creation, the creator let a private stochastic process determine the hop landing locations of each elementary particle. This process is a combination of a Poisson process and a binomial process. A point spread function controls the binomial process. The stochastic process possesses a characteristic function that causes the production of a coherent swarm. It is the Fourier transform (the spatial spectrum) of the detection probability density distribution. As a result, the point spread function is equal to the location density distribution of the produced swarm. This design ensures that when the characteristic function becomes wider, the point spread function becomes narrower. In this way, the creator gives his creatures the impression that he does not determine the hopping path. He leaves some freedom to the objects that are formed by the elementary particles. However, in the beginning, the entire lifecycle of all elementary particles is already archived in their private storage medium. After that archival, nothing changes in this storage medium. The archive can only be read. Since the timestamps are stored together with the locations, the corresponding Hilbert book contains the entire life chronicles of the elementary particle.

The version of the quaternionic number system that the private Hilbert space of the elementary particle selects determines the symmetry of the private Hilbert space and of the elementary particle. This is characterized by an electric charge that houses in the geometric center of the particle platform's parameter space. The axes of all Cartesian coordinate systems must be parallel or perpendicular to each other. The geometric center may differ and may even move. Only the ranking along the axles may differ in direction. The electrical charge turns out to be a consequence of the difference between the symmetry of the gliding platform and the symmetry of the background platform. Because only a small number of versions of the quaternionic number are allowed, there exist very few different electrical charges. As a result, electrical charges can occur in the proportions -3,-2,-1, 0, 1, 2, and 3.

The separable Hilbert space of the background platform is naturally embedded in the non-separable Hilbert space. This is because both Hilbert spaces have the same symmetry. The embedding does not cause any disruption of symmetry. This does not apply to the embedding of the footprints of the elementary particles, because their Hilbert spaces possess a deviating symmetry. When embedding, only isotropic disturbances of the symmetry can cause an isotropic disturbance. Such a disturbance may temporarily deform the embedding field.

The swarm of hop landing locations can generate a swarm of spherical pulse responses. Only an isotropic pulse causes a spherical shock front. This shock front integrates over time into the Green's function of the field. This function has volume, and the pulse response injects this volume into the field. The shock front then spreads this volume over the field. As a result, the initial deformation of the field is rapidly flowing away. The stochastic process must continue to deliver new pulses to achieve a significant and permanent deformation. To get an impression of the deformation we have to convolute the location density distribution of the hop landing location swarm with the Green's function of the field. Convolution blurs the image of the swarm. This does not give a correct picture, because the overlap of the spherical shock fronts depends on the spatial density of the swarm and on the time that the shock fronts need to overlap sufficiently. Far from the geometrical center of the swarm, the deformation is similar to the shape of the Green's function. The two functions still differ in a factor. This factor indicates the strength of the deformation. The factor is proportional to the mass of the particle. In fact, this is the method by which the scholars determine the mass of an object.

5 Modularity

Elementary particles behave as elementary modules. Together they form all the other modules that occur in the universe. Some modules constitute modular systems.

The composite modules and the modular systems are also controlled by a stochastic process. This is a different type of process than the type of process that regulates the footprint of the elementary particle. This second type controls the composition of the object. This type of stochastic process also possesses a characteristic function. This characteristic function is a dynamic superposition of the characteristic functions of the components of the compound object. The superposition coefficients act as displacement generators. They determine the internal positions of the components. The characteristic function connects to an additional displacement generator that regulates the movement of the whole module. This means that the composed module moves as one unit. The binding of the components is reinforced by the deformation of the embedding field and by the attraction of the electrical charges of the elementary particles.

This description shows that superposition takes place in the Fourier space. So what a composite module or modular system determines, is captured in the Fourier space. Locality does not play a role In Fourier space. This sketches the phenomenon that scholars call entanglement. In principle, the binding within a composite module is to a large extent established in the Fourier space. The parts can, therefore, be far apart. For properties of components, for which an exclusion principle applies, this can have remarkable consequences.

All modules act as observers and can perceive phenomena. Elementary particles are very primitive observers. All observers receive their information through the field in which they are embedded. The observed event has a timestamp. For the observer that timestamp locates in the past. As a result, the information is stored in the Euclidean format in the storage medium in a storage bin that contains a timestamp and a three-dimensional location. By the observer, that information is perceived in space-time coordinates. A hyperbolic Lorentz transformation describes the conversion of the Euclidean storage coordinates into the perceived spacetime coordinates. The hyperbolic Lorentz transformation adds time interval dilatation and length compression. The deformation of the embedding field also deforms the path through which the information is transported. This also influences the transported information.

6 Illusion

At the instant of creation, the creator fills the storage bins of the footprint operators. The contents of this store won't change anymore. The later events in the embedding field also have no influence on the archive. Since the creator uses stochastic processes to fill the footprint storage, intelligent observers will get the impression that they still possess free will. The embedding of the footprints follows step by step the time-stamped locations that were generated by the stochastic processes and were archived in the eigenspace of the footprint operator. The observer should not be fatalistic and think that his behavior does not matter because everything is already determined. The reverse is true. The behavior of each module has consequences because each perceived event affects the observer. This fact affects the future in an almost causal fashion. The stochastic disturbance is relatively small.

7 Cause

The driving force behind the dynamics of the universe is the continual embedding of the hop landing locations of the elementary particles into the field that represents the universe.

It seems as if the continuous deformation of the field seems to come out of nowhere and that the individual deformations then disappear quickly by the flooding away of the inserted volume. The expansion persists.

The shock-fronts play an essential role because the spherical fronts spread the volume into the field. The one-dimensional shock fronts carry information and also carry extra movement energy. They move the platforms on which elementary particles travel through the universe.

8 Begin to end

The universe is a field, and that field can be described by a quaternionic function. In the begin of its existence, the stochastic processes that produce particle hop landings that inject volume into this field had not yet done any work. Thus, the field did not yet contain any spatial volume. However, spread over the full spatial part of the parameter space, a myriad of stochastic processes immediately started to deform and expand the spatial part of the field. The deformations fade away but are quickly repeated by the recurrently regenerated hop location swarms. This produced a bumpy look of the early universe. This is not in accordance with the usual interpretation of the begin of the universe, which is sketched as a big bang at a single location.

Black holes are special phenomena. They are bordered areas in which volume can only be added by widening the border. No shock front can pass this edge. The black holes wipe elementary particles together at their border. Part of the footprint of the elementary particles hovers over the black hole region and the pulses extend the volume that is enclosed by the border into all directions. The BH is filled by the equivalent of storage capacity, which is no longer devoted to the modular design and modular construction process. Inside the BH region, these processes are impossible. Also, the elementary particles that are stitched at the border will be prevented from generating higher order modules.

This characterizes the event horizon of the BH. It also indicates what the end of the history of the universe will be. A huge BH uniformly filled with spatial volume. The platforms of the elementary particles can still cling at the outside of the border of the final BH.

9 Lessons

After the instant of creation, the creator does no longer care for his creatures. This creator is not a merciful God. It makes no sense to beg this creator for special benefits. For the creator, everything is determined. Due to the application of the stochastic processes, the intelligent observers still get the illusion that they have a free will. For their perception, all their actions cause a sensible result. The uncertainty that is introduced by the stochastic processes is relatively small.

The creator is a modular designer and a modular constructor. For his intelligent creatures, this makes an important example. Modular construction is very economical with its resources and provides relatively fast usable and reliable results. This method of working creates its own rules. It makes sense to have a large number and a large variety of suitable modules at hand. It even makes sense to create communities of module types and communities of modular system types.

The lessons, which the creator teaches his intelligent creatures, follow from the modular design of the creation. The lesson is not the survival of the fittest. The survival of the module type-community is more important than the survival of the individual modular system. It makes sense to care for the module type-community that the individual belongs to. It also makes sense to care for the module type-communities on which your module type-community depends. That then demands to properly secure the module communities of which one depends. It has much sense to care for the habitat of your module type-community.

10 Model alternatives

The underlying Hilbert book model provides choice freedoms that do not affect the functioning of the model. For example, the dynamic geometric data of events can be archived in the storage medium until they occur. Even if they are stored at the instant of the event itself, the picture perceived by observers is not disrupted. This does mean something for the interpretation of how the creator behaves. The creator can still consider the pleas of his creatures and adapt the future of these creatures by influencing the stochastic processes that determine the following dynamic geometric data. However, this means an extremely complicated intervention by a creator who has implemented all his other interventions in a very simple and economical way. It could unite the image of a Clement God with an otherwise heart damp creator who uses the evolution as his creation tool. At the same time, it makes the role of stochastic processes so difficult that their implementation passes from relatively simple to very complicated and incomprehensible.

11 Stochastic processes

Stochastic processes play a very important role in the Hilbert Book Model. Especially the processes that determine the hopping path of an elementary particle, govern the dynamic behavior in the universe. Everything shows that the creator always chooses the simplest way to achieve his goal. It is therefore interesting to check the possibilities of the realization of these processes. The direct determination of the hopping path seems very complicated. It is probable that a field that regulates the characteristic function of the process is first assumed. Or better yet the field that determines the spatial spectrum of this function. The function that describes this field is called the point spread function. Let's suppose that this function appears to be a three-dimensional normal distribution. Then the characteristic function is a Gaussian distribution. The life-long hopping path can now be formed by randomly arranging the rational elements in this field. This can be done throughout the life cycle, but it can also be limited to a recurring regeneration cycle that delivers a complete swarm of hop landing locations.

References

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